ORCAWALE 2008: Weekly Report

Report Dates: 7 – 13 September 2008 Chief Scientist: *Jay Barlow* Leg 2 Cruise Leader: *Jeremy Rusin*

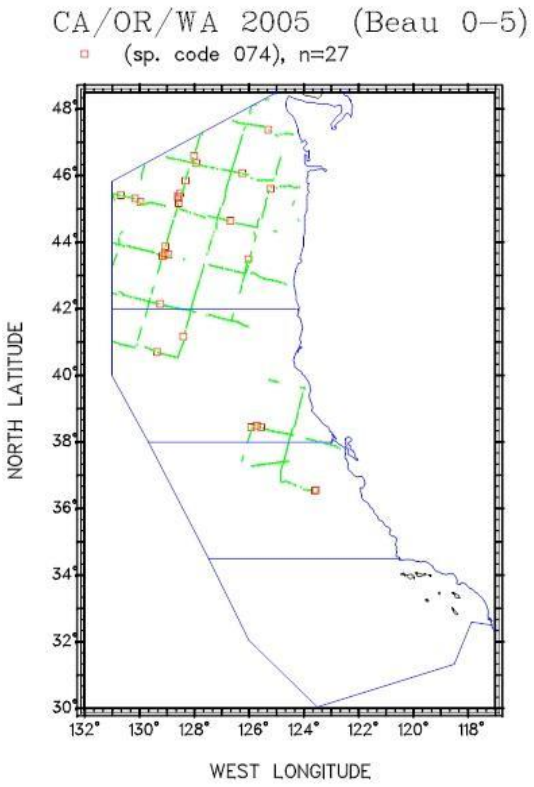
Weekly Science Summary
Jeremy Rusin

Sometimes you have greater appreciation for a challenging experience than one in which everything seemingly goes your way. Although our leg has only just ended, I can see I will look back on Leg 2 of ORCAWALE 2008 that way. Now, don't get me wrong; just because I have an appreciation for what we've been up against doesn't mean aspects of our time at sea haven't also been extremely frustrating. They have. We got close to our breaking points a couple times. We've been challenged at almost every turn – with weather, mechanical issues, injury (Colin, we are thinking of you and wishing you a speedy recovery!) and illness – and with every setback the scientists and crew of *McArthur II* became even more steadfast in successfully completing the work we set out to do.

Unlike some other surveys, the design of ORCAWALE necessitates that we avoid large gaps in our survey coverage. For this reason, during the difficult weather we experienced on this leg we were forced for the most part to sit tight until weather cleared and we could continue along our planned transect line. This design also requires that we survey in marginal conditions and remain vigilant even when it is unworkable in order to maximize windows of opportunity during our precious, limited time at sea. For example, when winds reach 40 kts and seas approach 15 ft, we can't run very far because we have to be positioned to continue working there when conditions allow it.

When we've had opportunities to work we have been extremely productive. When we lost members of our team we filled in those gaps. What I was reminded of every day is something the regular scientists and crew already knew – this stuff is hard. Conducting research in the field presents countless challenges, and so while this is supposed to be a science summary – what we've seen and not seen, the number of samples collected, the number of net tows completed – I'll take this opportunity to point out that science is much more than collecting and summarizing data. It's thinking about interesting questions to try to answer, designing experiments that will address your questions, facing setbacks (and there will be setbacks) and being resourceful to move forward in the face of challenges whether they are in your control or not. Science is also about building partnerships with those you can rely on for physical and intellectual (and sometimes emotional) support. In a nutshell, Leg 2 provided us an opportunity to experience this full spectrum.

I'd like to thank all of the scientists and crew of Leg 2 for their dedication and hard work to help us succeed in the face of such challenges. Your efforts are incredible. Thank you for making this a very memorable and enjoyable leg.



ORCAWALE-08 Transect lines to date. Red squares denote fin whale sightings during Legs 1 and 2.

Marine Mammal Effort Summary.

Date	Time Start / End	Start location / End location	Dist. Surveyed(nmi)	Average Beaufort
083108	1002	N43:03.47 W126:08.15	112.7 nmi	5.5
	1846	N41:40.80 W126:34.33		
090108	0703	N41:39.88 W126:37.77	40.5 nmi	5.1
	1154	N41:28.03 W125:46.07		
090208	0703	N43:04.56 W126:06.80	62.1 nmi	4.9
	1545	N42:42.27 W124:35.91		
090308	0913	N39:54.25 W125:32.20	25.6 nmi	6.2
	1200	N39:30.22 W125:16.24		
090408	0707	N38:12.00 W124:29.20	99.3 nmi	4.0
	1940	N36:45.49 W124:23.14		
090508	0701	N36:44.11 W124:22.40	49.3 nmi	3.1
	1736	N36:31.26 W123:23.71		
090608	0657	N38:14.65 W124:28.45	79.5 nmi	3.0
	1857	N39:34.57 W124:00.09		

Marine Mammal Sighting Summary.

CODE	SPECIES	TOT#
017	Delphinus delphis	11
022	Lagenorhynchus obliquidens	5
027	Lissodelphis borealis	2
036	Globicephala macrorhynchus	1
037	Orcinus orca	1
044	Phocoenoides dalli	8
063	Berardius bairdii	2
074	Balaenoptera physalus	3
076	Megaptera novaeangliae	2
079	unid. large whale	2
CU	Callorhinus ursinus	1
MA	Mirounga angustirostris	4
	TOTAL	42

Cetacean Biopsy Report

Suzanne Yin, Allan Ligon and Mark Deakos

Species	Common name	No. weekly samples	No. weekly takes	Total samples	Total takes
Balaenoptera physalus	Fin whale	0	0	14	20
Berardius bairdii	Baird's beaked whale	0	0	1	1
Delphinus delphis	Short-beaked common dolphin	0	0	22	55
Globicephala macrorhynchus	Short-finned pilot whale	0	0	4	5
Lagenorhynchus obliquidens	Pacific white-sided dolphin	0	0	25	49
Lissodelphis borealis	Northern right whale dolphin	0	0	10	23
Orcinus orca	Killer whale (non-SRKW)	0	0	2	9
Weekly Total		**0**	**0**	**78**	**162**

Photo Report
Jim Cotton and Chris Cutler

This was an uneventful week for the shutterbugs. Due to challenging weather conditions and the general lack of decent opportunities, we only managed to obtain useable photos from two cetacean sightings. We obtained dorsal fin shots of two blue whales in one sighting and photographed 18 different short-beaked common dolphins in another.

Common dolphins, one with a white dorsal fin and rostrum.

Blue whale showing its dorsal fin and the characteristic mottling patterns on its back.

Seabirds
Michael Force and Sophie Webb

In many respects, this week was practically a mirror image of the previous two weeks; the entire leg in fact. However, the apparent uniformity of the marine environment revealed by a cursory glance at the ocean belies a dynamic situation. Our weekly and daily species totals this week (33 and 14 respectively) perfectly fit the averages for these two values recorded for Leg 2. However, the progression of the seasons is clearly punctuated by the flux of southbound migrants and the shift in age classes for some of these species. Offshore, Long-tailed Jaegers are moving south in large numbers, often over a hundred per day. Notable during the final week of Leg 2 was the preponderance of juveniles and immature birds, these age classes now outnumbering adults. Adults tend to move south first, ahead of the juveniles, and this was obvious in our strip transect data. Similarly, Sabine's Gulls, although a much smaller sample, also reveal this pattern. Closer to shore, we noticed the abundance of Pink-footed Shearwaters, greatly outnumbering Sooty Shearwaters, a situation analogous to that found on recent seabirding trips off Monterey.

Juvenile Long-tailed Jaeger. Photo: Sophie Webb

Another indicator of the advancing fall migration was the appearance of yet more lost migrants. These include Brown-headed Cowbirds, Bank Swallows, Surfbird, Mourning Doves, a couple of small flocks of Northern Pintails and Warbling Vireo. A few other

mysterious "little brown jobs" didn't remain long enough to be identified.

For those keeping track of such things, we've included a list of what we saw this leg.

Leg 2 Species Summary

Western Grebe	*Aechmophorus occidentalis*
Laysan Albatross	*Phoebastria immutabilis*
Black-footed Albatross	*Phoebastria nigripes*
Northern Fulmar	*Fulmarus glacialis*
Pink-footed Shearwater	*Puffinus creatopus*
Flesh-footed Shearwater	*Puffinus carneipes*
Buller's Shearwater	*Puffinus bulleri*
Sooty Shearwater	*Puffinus griseus*
Leach's Storm-Petrel	*Oceanodroma leucorhoa*
Ashy Storm-Petrel	*Oceanodroma homochroa*
Fork-tailed Storm-Petrel	*Oceanodroma furcata*
Brown Pelican	*Pelecanus occidentalis*
Double-crested Cormorant	*Phalacrocorax auritus*
Brandt's Cormorant	*Phalacrocorax penicillatus*
Pelagic Cormorant	*Phalacrocorax pelagicus*
Northern Pintail	*Anas acuta*
Black Turnstone	*Arenaria melanocephala*
Surfbird	*Aphriza virgata*
Western Sandpiper	*Calidris mauri*
Red-necked Phalarope	*Phalaropus lobatus*
Red Phalarope	*Phalaropus fulicarius*
South Polar Skua	*Stercorarius maccormicki*
Pomarine Jaeger	*Stercorarius pomarinus*
Parasitic Jaeger	*Stercorarius parasiticus*
Long-tailed Jaeger	*Stercorarius longicaudus*
Heermann's Gull	*Larus heermanni*
California Gull	*Larus californicus*
Glaucous-winged Gull	*Larus glaucescens*
Western Gull	*Larus occidentalis*
American Herring Gull	*Larus smithsonianus*
Sabine's Gull	*Xema sabini*
Elegant Tern	*Thalasseus elegans*
Arctic Tern	*Sterna paradisaea*
Common Murre	*Uria aalge*
Pigeon Guillemot	*Cepphus columba*
Marbled Murrelet	*Brachyramphus marmoratus*
Xantus' Murrelet	*Synthliboramphus hypoleucus*
Cassin's Auklet	*Ptychoramphus aleuticus*
Rhinoceros Auklet	*Cerorhinca monocerata*
Horned Puffin	*Fratercula corniculata*
Tufted Puffin	*Fratercula cirrhata*
Band-tailed Pigeon	*Patagioenas fasciata*
Mourning Dove	*Zenaida macroura*
Bank Swallow	*Riparia riparia*
Warbling Vireo	*Vireo gilvus*
Brown-headed Cowbird	*Molothrus ater*

Acoustics Squeakly Report
Tina Yack

Circumstance beyond our control, including but not limited to an unexpected port call so that a crew member could receive medical treatment (we wish you well Colin!) did not allow for very much acoustic effort

this week. There are many inherent difficulties associated with field work at sea, and we quite literally have to go with the flow out here.

This week there were approximately 35 hours of recording effort and 38 hours of monitoring effort (Table 1). Despite our difficulties, there were 25 acoustic encounters, however only five of these matched visual detections (Table 2). The highlights of this week's acoustic adventures include: a Blue whale encounter, a fin whale encounter, more short-beaked common dolphin encounters, a sperm whale acoustic encounter, and more porpoises.

In the figures below you can see whistles and clicks from two short-beaked common dolphin encounters. The first figure illustrates an acoustic encounter with a single subgroup of dolphins within 300 m of the hydrophone array. Whereas, the second figure, illustrates an acoustic encounter of several dolphin subgroups all around the ship, and numerous individuals less than 50 m from the hydrophone array.

Table 1. Rainbow Click Recording Effort

(Sample Rate: 480 kHz: Hydrophones 4 and 5)

Date	Average	Recording	Recording	Recording	Monitoring	Acoustic
9/7/2008	4.6	6:56	13:37	6:41:00	6:00	1
9/8/2008	3.4	10:20	15:00	4:40:00	4:00	8
9/9/2008	OFF	OFF	OFF	OFF	OFF	OFF
9/10/2008	OFF	OFF	OFF	OFF	OFF	OFF
9/11/2008	OFF	OFF	OFF	OFF	OFF	OFF
9/12/2008	4.4	7:07	17:40	10:33:00	8:30	13
9/13/2008	3.0	6:56	20:20	13:24:00	9:24	3
Total				**35:18:00**	**27:54:00**	**25**

Table 2. Acoustic Encounters

Species ID	Number of Acoustic Encounters
Blue whale	1
Common dolphin	2
Dall's porpoise	1
Fin whale	1
Sperm whale	1
unid beaked whale	5
unid cetacean	3
unid delphinid	2
unid porpoise	10
Total	**25**

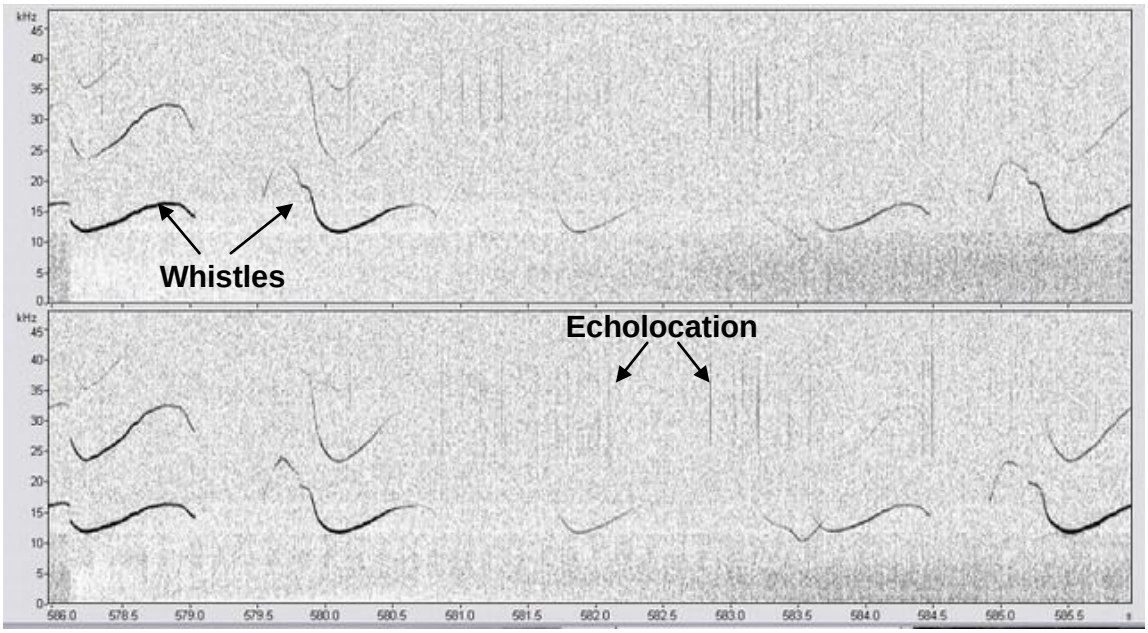


Figure 1. Spectrogram image of an acoustic encounter of short-beaked common dolphins at 08:07 on 9/5/08.

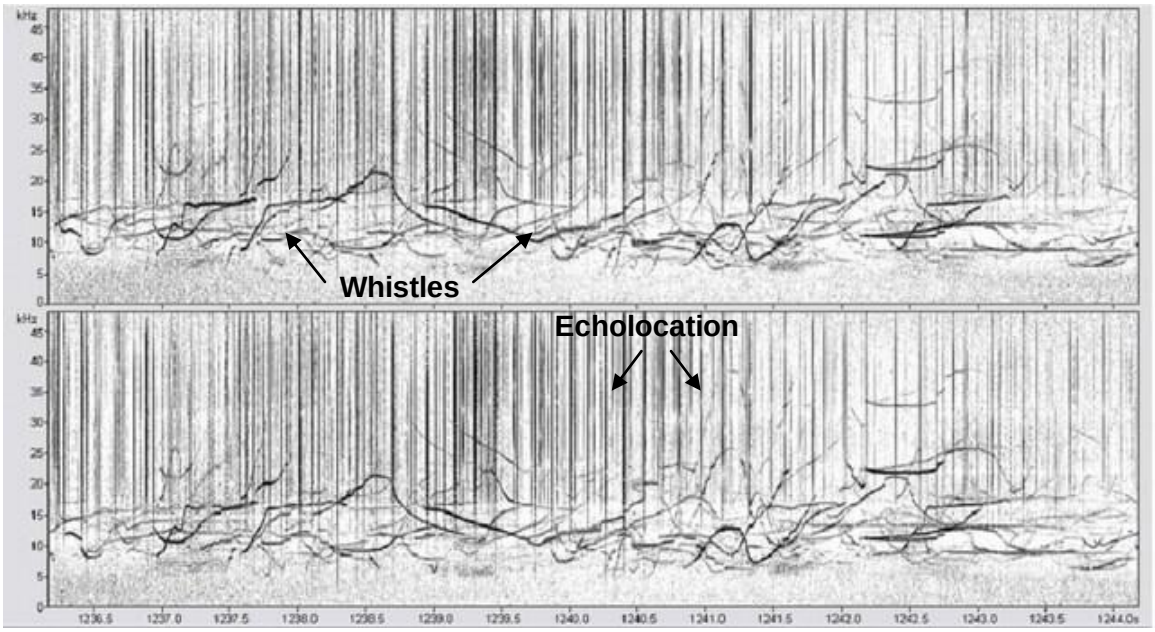


Figure 2. Spectrogram image of an acoustic encounter of short-beaked common dolphins at 10:23 on 9/5/08.

Squid Jigging Efforts: P.I. Iliana Ruiz-Cooley

With assistance from Jeremy Rusin, Karla Garcia, Jim Cotton, Mark Deakos, Dave Lapointe and Jim Kintzele

The end of this leg has come and with that Karla and I say goodbye to sailing, jigging, the scientific team, officers and crew. I not only collected data and biological samples for the projects – odontocete food web and jumbo squid feeding ecology – but I also sailed for first time on the California Current and observed the variation in the ecosystem in comparison with the Eastern Tropical Pacific and Gulf of Mexico. For example, no small or medium size squid were observed at the sea surface and only very few fish such as Pacific saury (*Cololabis saira*) and anchovy were observed.

Figure 1. Jumbo Humboldt squid, *Dosidicus gigas*.

Interestingly, the depth and behavior of jumbo squid (*Dosidicus gigas*) varied between the stations and weeks even though we were in the same overall area. For example, in some stations, we had to repeatedly let out about 150-200 m of fishing line in order to catch squid, while in other areas after the first squid was caught other squid were easily caught at or near the surface.

For the last week, we were only able to jig for two days. The "equipo calamar" consisted of Jeremy (cruise leader, aka gaffing machine), Mark, Jim C., Jim K., and our expert gaffer Dave. A total of six squids were caught. The largest weighed 24.6 lbs and was 131.3 cm in length. For this leg, we caught about sixty squids, whose weight ranged from 10.13 to 32.2 lbs. The majority of the specimens collected were females; only 22 percent were males.

This has been a great experience for Karla and me. Great efforts were made by everyone to catch the jumbo squid. We thank all those who took the time to participate and learn more about this interesting and mysterious cephalopod. Special thanks to Pete Davison and Ryan Driscoll for their support in providing other biological samples. We temporarily say goodbye and good luck in future legs!

Oceanography

Ryan Driscoll

I'd like to use this last weekly to thank everyone who supported Oceanography throughout this last leg: Jeremy Rusin and Karla Garcia for there assistance with XBTs and Bongos. Also, the ship's ET, Jim Kintzele, who kept our ship's computers recording despite not having our Survey Technician aboard. The excellent support from SWFSC, the scientists and crew aboard *McArthur II* speaks wonders. We managed to maintain sampling protocol despite the many unexpected challenges this leg. Thanks everyone!

Here is our abbreviated last week, by the numbers:

Day	CTD	XBT	Surface chlorophylls	Bongo Tows	HAB
9/7/2008	0	1	1	0	6
9/8/2008	0	1	1	0	6
9/9/2008	0	0	0	0	0
9/10/2008	0	0	0	0	0
9/11/2008	1	3	3	1	18
9/12/2008	1	5	4	1	24
9/13/2008	0	2	2	0	12
Grand Total	36	162	145	30	862

Special dispatch from visiting scientist Ioana Ionescu

Offshore of San Francisco this week we found suitable habitat for, among other species, Pacific white-sided dolphins (*Lagenorhyncus obliquidens)* and killer whales *(Orcinus orca)*. Both species are highly mobile and can travel long distances on a daily basis. Moreover, the spatial scale at which they explore oceanic habitat can be very large.

Pacific white-sided dolphins are stocky with short thick snouts. The relatively large dorsal fin is strongly recurved and is an important identifying characteristic. There are several uncommonly occurring color morphs: one has the typical color pattern but with black and gray shades replaced by an orange yellow color; the second one with enlarged white suspender stripes above and behind the eye while the third displays a type of leucism where remnants of the natural color pattern are visible. Pacific white-sided dolphins are very gregarious, often occurring in large herds, conspicuous by individual animal's leaping, flipping, somersaulting and other extreme aerial behaviors.

The killer whale is the largest member of the dolphin family (family *Delphinidae*) and was one of the most cosmopolitan and wide-ranging of all cetaceans seen during the last two weeks. Orca literally means "the shape of a barrel or cask" in Latin and the name was given due to the Orca's heavy and stocky body shape. Killer whales are easily recognized by the large dorsal fin of the males and the unique black and white color pattern. However, at a great distance groups without adult males can be confused with other oceanic dolphins such as false killer whales *(Pseudorca*

crassidens) or Risso's dolphins *(Grampus griseus)*. In addition to the bold black and white color pattern, the pectoral fins are large and rounded and more paddle-shaped than other dolphin species.

As apex predators in the Pacific Ocean, killer whales can play an important role as an indicator of ecosystem health. An abundance of top predators indicates that the underlying trophic levels have healthy populations. However, their high mobility can confound interpretation of species relationships with their habitat. Hence, the multi-disciplinary ecosystem approach employed on NOAA surveys such as ORCAWALE 2008 attempts to understand the underlying principles affecting their distribution and population dynamics.